

I. Amendments to the Specification

Please substitute the paragraphs listed below for the like-numbered paragraphs in the specification as filed. The paragraphs 11-14 are reproduced below un-indented to indicate correction of an indentation error in these paragraphs of the specification as filed.

[0007] Further advances have occurred in the abilities of operating systems to enumerate the specific identities of the various devices that may be connected to a computer at any given time. For example, through a protocol known as "Plug-and-Play," all of the modern Microsoft Windows operating systems, starting with version 95, are now able to interrogate their various buses and ports to determine what devices are connected to a computer. Devices have also been designed to respond to such enumeration requests by not only identifying themselves, but also by identifying in some manner the driver software which they require, such that operating systems may then prompt the user to find and present the appropriate driver software for installation as part of the operating system to support the operation of each such device. ~~devices.~~

[0011] The software problems normally fall into one of the following scenarios: ~~eenarios:~~

[0012] The device was never installed properly.

[0013] The device is not able to communicate with the computer.

[0014] The device is using an incorrect driver. Typically, the customer has installed the device but has installed an incorrect driver, one not suited for the particular device.

[0021] Hewlett-Packard has an “HP INSTANT SUPPORT” (service mark) which includes and uses software designed by Motive Communications, Inc. Briefly discussed, when a user requests support (from the “HP INSTANT SUPPORT” website), the user’s computer downloads and receives a user support program named “TUNER” (a trademark of Motive Communications, Inc.). This TUNER program maintains an updated set of web network pages (and the like) on the user’s computer and assists the user with various self-service tasks as well as with seeking assistance.

[0023] The TUNER program is also limited by its chat based design. When a user seeks assistance, an online chat dialog is established between the user and the support center in an attempt to trouble shoot the problem. Such a design requires that both the user and the support specialist are simultaneously available to discuss the possible problems and solutions. The support specialist is also under pressure to offer advice immediately, possibly without having time to fully research or think about the problem. In addition, for users user’s using modems, such a design requires a possibly lengthy use of the user’s phone line. Such limitations may make the support service inconvenient for the user and discourage some users from taking advantage of the service.

[0031] An embodiment of the present invention is designed to be implemented as part of an online support service that is provided by a service provider that may be a device vendor, a computer vendor, or an operating system vendor to it’s customers. Such a service can also be offered by a third party. The service acts as a remote support center for customers in need of computer support.

[0032] A user sitting at a computer and desiring computer support services begins by turning on the computer’s Internet browser and then communicating over the Internet with the web network site of the support center. The user first selects “Service” and then “Remote E-mail Support.”

[0033] After clicking on "Remote E-mail Support" the user is prompted that better support can be provided if detailed device information is attached to the support request. The user is given the option of using a [[an]] network application that will test the devices connected to the user's computer and attach detailed device information to the support request. The user is then prompted to fill out a form describing the particular problem the user is experiencing. Alternatively, the user could fill out the form before deciding whether to take advantage of the network application's diagnostic features. After submitting the support request, the user waits for a response from the support center suggesting possible solutions.

[0034] Now referring to FIG. 1, a possible configuration of the various elements of the present embodiment are shown. Located on a user's computer 102 are a number of devices 108 connected both internally and externally to the user's computer 102. Also located on the user's computer is a [[an]] network browser 104 such as Microsoft Explorer or Netscape Navigator. The user's computer 102 is capable of transmitting information to a server 110 through a user sender 106. The user sender 106 can take the form of an E-mail application, FTP program, or any other means of transmitting information to the server 110. The user sender 106 can also be part of the network browser 104 by using HTTP/HTTPS to post the information to an ASP page on the server 110. One advantage of this approach is that the user's computer 102 only needs the network browser 104 pre-installed on their machine to take advantage of the invention.

[0036] The information harvester 300 can be a [[an]] network application such as a Java Applet, ActiveX Control (a trademark of Microsoft Corporation), or other browser plug-in. Such a design allows the network browser 104 on the user's computer 102 to run the information harvester 300 without the user ~~needing~~ needed to specifically download and install the information harvester 300, making the process more user friendly. With the use of a [[an]] network application, the information harvester 300 is downloaded and temporarily stored by the Internet browser 104 in the same way that a graphic image is downloaded and temporarily stored when a web

[[network-]] page is viewed. Another advantage of such an approach is that it allows computers with scarce storage space to immediately recover storage space after the execution of the information harvester 300. The information harvester 300 could alternatively be pre-installed on the user's computer 102.

[0038] In the present embodiment, the device enumerator 302 and the device tester 304 use standard Windows APIs (application programming interface) to perform their enumeration and testing functions instead of proprietary APIs. One advantage to this design is that the information harvester 300 can be much smaller in size. Not only does this smaller size allow the information harvester 300 to be used on computers with limited storage space, such as a PDA, but it also permits the information harvester 300 to be run by the network browser 104 without a lengthy download time and possible failed downloads, especially for users [[user's]] that rely on a modem as their means for connecting to the network. Alternatively, the device enumerator 302 and device tester 304 could rely on their own proprietary APIs or a combination of proprietary APIs and standard APIs.

[0039] The formatter 114, located on the server 110, converts the output of the information harvester 300 into a format that can be read and understood by a person. In the present embodiment, the formatter 114 is also a [[an]] network application that is run by the user's Internet browser 104, converting the information into an HTML page. (See Appendix A). While the formatter 114 in the present embodiment uses an HTML page, the information could be formatted into any number of formats which allow the information to be organized and accessed. Alternatively, the information gathered by the information harvester 300 could be first sent to the server 110 via the user sender 106 before being formatted by the formatter 114. In such a case, the formatter 114 would not need to be a [[an]] network application. However, such a design forces the user to transmit the gathered information to the server 110 before the user may have a chance to review the information that was gathered.

[0042] The support specialist 118 [[,]] can be the terminal of a live technical support person. However, the support specialist 118 need not be a live person. The user could interact with an artificial support specialist 118 consisting of a computer that is programmed to send pre-determined suggestions in response to particular support requests for support. The support specialist 118 contains an E-mail viewer 120. The viewer can be any of the commercial or free E-mail viewers on the market, such as Microsoft Outlook, or Eudora. One of the advantages of transmitting the information to the support specialist 118 as an E-mail is that since most computers contain an E-mail viewer 120 or have network access where an E-mail viewer can be accessed from a web [[network-]] page, the support specialist 118 need not be confined to a proprietary program installed on a limited number of specific computers in order to access and respond to support requests. This freedom allows the support specialist 118 to be able to access and respond to support requests from a dedicated support center, from the specialist's home computer, from a computer accessed on the road such as a client's computer, from a public access computer, or even from a hand-held computer, such as a PDA.

[0043] Now referring to FIG. 2, the operation of an embodiment of the present invention is shown. Starting at step 202, the user's network browser 104 runs the information harvester 300 as a [[an]] network application gathering detailed information about the devices 108 connected to the user's computer 102. At step 206, the Internet browser 104 runs the formatter 106 as a [[an]] network application formatting the results of the information harvester 300 into an HTML document. At step 208, the HTML document is displayed to the user. At step 210, the user fills out a support request form through the network browser 104. The user may describe what device 108 is causing trouble and what [[the]] problem the user is experiencing with that device 108. The user could also include other information such as steps the user has already taken to try and repair the device 108. Step 206 can also be done before running the information harvester 300 at step 202.

[0049] While FIG. 3 shows one embodiment of the information harvester 300, other embodiments are possible. The present device tester 304 relies on querying the operating system to test each device 108 and report the needed information. The device tester 304 [[in]] could instead self test each device 108, without relying on the operating system to provide the information or use self tests to provide information not available from the operating system. Further, the device enumerator 302 need not identify all devices 108 connected to the user's computer 102. The user could identify or select which devices 108 the user wanted support for, and only those devices 108 would be tested by the device tester 304.

[0051] In the present embodiment, the user is shown the screen shot displayed in FIG. 4 at step 208 in FIG. 2. The information for each device will be given. The user will then enter their name and email address in the appropriate boxes and describe the user's problem in the user's own words as described for step 210 in FIG. 2. If the user decides not to submit the support request, the user will click the cancel button. If the user decides to submit the support request, the user will click the submit button. In the present embodiment, FIG. 4 is displayed as an an [[a]] HTML page, and is located on the user's computer 102. Only if the user clicks submit is the information displayed on this HTML page transmitted to the server 110. This arrangement has the added security benefit of letting the user decide whether or not to transmit detailed information about the user's computer 102 after being able to review the information. Alternatively, the information could be displayed as a web [[network-]] page from the server 110. The information could also be displayed to the user in some non-HTML format.

[0052] It is possible for many of the various elements of and steps carried out by the invention to be combined into one or more scripts or computer programs. For example, the formatter 114 could be included as part of the information harvester 300 and the user sender 106 could be incorporated into the network browser 104, or they could be made part of or be associated with some other system element, or made an independent program or script.